

Sanitation for a rural school in Uganda

– a successful implementation process

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Uganda

- East-Africa
- total area of 236.040 km² - about the size of UK
- the 23rd poorest country in the world
- ~25 Mio people
- ~12% live in urban areas
- Infant mortality rate: 81 per 1.000 live births
- Life expectancy: 42 years
- Total fertility rate/per woman: 7,1 children



Sanitation

- 41% of the population has access to improved sanitation facilities with a majority in urban areas
- Uganda joins the countries which are not able to reach the MDGs by 2015



background

Kalungu Girls Secondary School

- boarding school of the “Sacred Heart Sisters”
- ~350 girls
- Southern Uganda (in Masaka District)



situation before the project

Wastewater

- drained away in soak pits
- no wastewater treatment

Grey water

- discharged untreated into a ditch outside the school's compound

Human excreta

- disposed of via app. 35 pit latrines
- flush toilets



main problems

Wastewater & Grey water

- groundwater pollution

Human excreta

- Groundwater pollution
- badly smelling, full of flies and in unhygienic conditions
- limited space of the school's compound

➔ Problems with the water quality and the unsatisfying conditions of toilet facilities caused the administration of the school to ask for support to improve the situation

project implementation

- Feasibility study 2000; planning, implementation/construction and training 2003
- Client: Sisters of the Sacred Heart
- Local partners: Kalungu Girls Secondary School, Norman Constructions

project implementation - the hardware

1. Dry diverting toilets

- 45 dry toilets for the pupils
- diverted urine:
 - is drained in soak pits
 - reuse is optional
- faeces (incl. anal cleansing material and ash):
 - are collected in locally produced wooden containers
 - dried in a covered composting area
 - reused in the surrounding banana and matoke plantation





2. Demonstration dry diverting toilet:

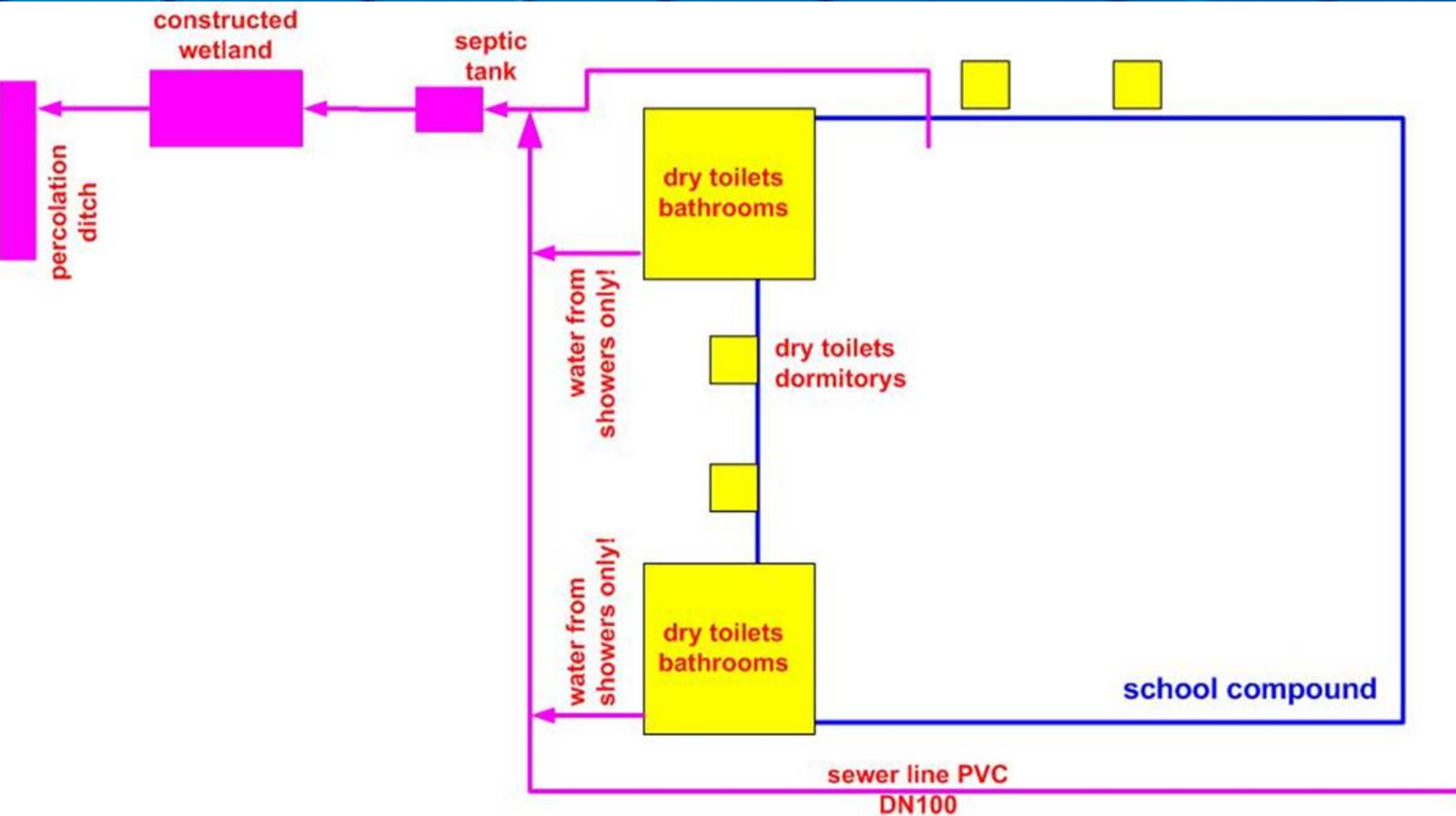
- for the staff and as demonstration unit for guests
- equipped additionally with an urinal to avoid misuse by male users
- diverted urine:
 - collected in jerry cans and reused as fertiliser
- faeces (incl. anal cleansing material and ash):
 - are collected in locally produced wooden containers
 - dried in a covered composting area
 - reused in the surrounding banana and matoke plantation



3. Wastewater treatment

- pre-treated in a septic tank to remove solids
- horizontal subsurface flow constructed wetland system
- infiltration of the treated wastewater into the ground through a percolation trench





project implementation - the software

1. Participatory planning

- together with the teachers the details of the demonstration unit were developed to create the feeling of ownership and responsibility
- A series of possible designs were presented to the teachers and any decisions (like location of the toilet; sitting or squatting type; urinal for men,...) were discussed among them

2. Training

- of students
- of teachers
- the O&M personal and
- the local technicians



comparison of costs

Option 1 - EcoSan concept:

- dry urine diversion toilets (45 units)
- sewer line for grey water and
- a horizontal subsurface flow constructed wetland (area app. 100m²)

Option 2 - conventional sanitation concept:

- flush toilets for the students (30 units)
- separate sewer system for black water
- mechanical pre-treatment
- pumping station and
- a vertical subsurface flow constructed wetland (area app. 500m²)

Option 1	no.	unit	unit cost	total cost
pipng	250	m	15.750,00 UGX	3.937.500,00 UGX
manholes incl. covers	5		100.000,00 UGX	500.000,00 UGX
fittings	1	lump sum	1.750.000,00 UGX	1.750.000,00 UGX
filter unit	1	lump sum	7.875.000,00 UGX	7.875.000,00 UGX
wastewater treatment system	100	m ²	61.250,00 UGX	6.125.000,00 UGX
dry toilets	45	units	400.000,00 UGX	18.000.000,00 UGX
				38.187.500,00 UGX

Option 2	no.	unit	unit cost	total cost
pipng	250	m	15.750,00 UGX	3.937.500,00 UGX
manholes incl. covers	5		100.000,00 UGX	500.000,00 UGX
fittings	1	lump sum	1.750.000,00 UGX	1.750.000,00 UGX
filter unit	1	lump sum	7.875.000,00 UGX	7.875.000,00 UGX
pumping station	1	lump sum	2.000.000,00 UGX	2.000.000,00 UGX
wastewater treatment system	500	m ²	61.250,00 UGX	30.625.000,00 UGX
flush toilets incl. plumbing	30	units	600.000,00 UGX	18.000.000,00 UGX
				64.687.500,00 UGX

The main differences:

- the significantly smaller wastewater treatment system for option 1 (Urine diversion significantly reduces the load of nitrogen)
- and the pumping station additionally required for option 2

the following costs were considered:

- investment costs
- cost for reinvestment and
- operating costs

The calculation is based on the following assumptions:

- timeframe for cost comparison: 50 years
- reinvestments depend on life-span of individual parts of the system
- interest rate 8% (UCB 2002)

conclusions & recommendations

The success is based on a variety of reasons

- teachers and pupils are using the same type of toilets and the teaching personal is committed to this new technology
- all stakeholders were involved from the beginning of the project, any design decisions was met by the users
- the presence of the constructors was utilised to sensitise and train teachers and pupils.

